

CLAIMS

1. (Cancelled).
2. (Previously Presented) A bell as claimed in claim 25, wherein said first three frequencies are due to modes with no ring nodes.
3. (Previously Presented) A bell as claimed in claim 25, wherein, of the modal frequencies, the frequencies due to modes with no ring nodes are all below any frequencies due to modes with ring nodes.
4. (Previously Presented) A bell according to claim 25 wherein the bell has a top portion, a side portion and a mouth, the side portion extending from the top portion to the mouth, the outer surface of the side portion being generally in the form of a truncated circular cone.
5. (Previously Presented) A bell according to claim 25 wherein the bell has a top portion, a side portion and a mouth, the side portion extending from the top portion to the mouth, the inner surface of the side portion being generally in the form of a truncated circular cone.
6. (Previously Presented) A bell according to claim 25 wherein the bell has a top portion, a side portion and a mouth, the side portion extending from the top portion to the mouth, the outer surface of the side portion being generally convex.
7. (Previously Presented) A bell according to claim 25 wherein the bell has a top portion, a side portion and a mouth, the side portion extending from the top portion to the mouth, the inner surface of the side portion being generally concave.

8. (Previously Presented) A bell according to claim 25 wherein the bell has a top portion, a side portion and a mouth, the side portion extending from the top portion to the mouth, the outer surface of the side portion substantially consisting of a generally convex portion and a portion generally in the form of a circular cylinder.

9. (Previously Presented) A bell according to claim 25 wherein the bell has a top portion, a side portion and a mouth, the side portion extending from the top portion to the mouth, the inner surface of the side portion substantially consisting of a generally concave portion and a portion generally in the form of a circular cylinder.

10. (Previously Presented) A bell according to claim 25 wherein the bell has a top portion, a side portion and a mouth, the side portion extending from the top portion to the mouth, the outer surface of the side portion substantially consisting of a generally convex portion and a portion generally in the form of a truncated circular cone.

11. (Previously Presented) A bell according to claim 25 wherein the bell has a top portion, a side portion and a mouth, the side portion extending from the top portion to the mouth, the inner surface of the side portion substantially consisting of a generally concave portion and a portion generally in the form of a truncated circular cone.

12. (Previously Presented) A bell according to claim 25 wherein the side portion is generally tapered.

13. (Currently Amended) A bell ~~having a plurality of modal frequencies, first at least four frequencies being as claimed in claim 25,~~ wherein the first four of said frequencies, at minimum, are substantially in an harmonic sequence.

14. (Cancelled.)

15. (Currently Amended) A method for designing a bell shape for a bell having a plurality of ~~modal~~ modal frequencies, wherein the first three of said frequencies, at minimum, are substantially in an harmonic sequence, the method comprising the steps of selecting an initial bell shape and using the initial bell shape in an optimization procedure for modifying the bell shape such that said first three frequencies are substantially in an harmonic sequence, comprising choosing a starting geometry in which the lower frequency modes to be tuned by shape optimization are purely circumferential modes.

16. (Previously Presented) A method according to claim 15 wherein the initial bell shape is such that, of said modal frequencies, all the frequencies due to modes without ring nodes are below any frequencies due to modes with ring nodes.

17. (Original) A method according to claim 15 wherein the initial bell shape is such that the first at least three frequencies are due to modes with no ring nodes.

18. (Previously Presented) A method according to claim 16 wherein the initial bell shape has a top portion, a side portion and a mouth, the side portion extending from the top portion to the mouth, the initial bell shape being selected by introducing one or more of the following shape features to a first bell shape:

- (a) conicity or increased conicity;
- (b) tapering of the side portion or increased tapering;
- (c) concavity with respect to the inside surface of the bell or increased concavity;

- (d) increased length of the side portion; or
- (e) decreased thickness of the side portion.

19. (Original) A method according to claim 15 wherein the initial bell shape is a rescaled existing bell shape for a bell having the first at least three frequencies substantially in an harmonic sequence.

20. (Previously Presented) A method according to claim 15 wherein the optimization procedure comprises the steps of:

- (a) setting the current bell shape to the selected initial bell shape;
- (b) selecting one of the first three frequencies to be tuned as a current objective;
- (c) selecting a desired value for the current objective to attain or a desired range for the current objective to fall within;
- (d) modifying the current bell shape in accordance with an optimization method, the optimization method being to cause the value of the current objective to move towards the desired value or range;
- (e) repeating step (d) as many times as necessary for the value of the current objective to become substantially equal to the desired value or for the objective to fall within the desired range;
- (f) if the at least first three frequencies to be tuned are not substantially in an harmonic sequence, selecting one of the at least three frequencies to be tuned as the current objective;
- (g) repeating steps (c) to (e) in relation to the current objective, subject to a suitably chosen constraint or constraints to cause at least one of

the frequencies to be tuned to approach or attain a desired value or desired frequency ratio; and

- (h) repeating steps (f) and (g) until the at least first three frequencies are substantially in an harmonic sequence.

21. (Original) A bell having a bell shape designed in accordance with the method of any one of claims 15 to 17.

22. (Previously Presented) An axisymmetric bell having a top portion, a side portion and a mouth, the side portion extending from the top portion to the mouth, a meridional cross-section of the side portion being substantially geometrically similar to a cross-section having:

- (a) an outer line formed by fitting an arc of a circle to the three points having rectangular coordinates  $x$ ,  $y$  of nodes as set out in table 3; and
- (b) an inner line formed by fitting a line to points having rectangular coordinates  $x$ ,  $y$  of the nodes as set out in table 2.

23. (Previously Presented) An axisymmetric bell having a top portion, a side portion and a mouth, the side portion extending from the top portion to the mouth, a meridional cross-section of the side portion being substantially geometrically similar to a cross-section having:

- (a) an outer line formed by joining a straight line to two points having rectangular coordinates  $x$ ,  $y$  of the nodes as set out in table 6; and
- (b) an inner line formed by fitting a line to points having rectangular coordinates  $x$ ,  $y$  of the nodes as set out in table 5.

24. (Currently Amended) A bell having a plurality of modal frequencies comprised of means for producing the first at least two frequencies of the plurality substantially in an harmonic sequence and means for producing the third frequency of the plurality substantially in an harmonic sequence, the means for producing the third frequency comprising choosing a starting geometry in which lower frequency modes are purely circumferential modes.

25. (Currently Amended) A bell having a plurality of modal frequencies, the bell having a bell structure including a top portion, a side portion and a mouth, the side portion extending from the top portion to the mouth, and physical characteristics of the bell structure being selected from the group consisting of conicity of the top portion, wall thickness of the top portion, length of the side portion, conicity of the side portion, wall taper of the side portion, wall curvature of the side portion, and wall thickness of the side portion, such as to provide optimal tuning means for producing a first three frequencies of the plurality of modal frequencies substantially in an harmonic sequence, with lower frequency modes being purely circumferential modes.